The Wrongful Conviction Law Review

Cross-Examination Fails to Safeguard Against Feedback Effects on Eyewitness Testimony

Taylor C. Lebensfeld et Laura Smalarz

Volume 3, numéro 3, 2022

Innocence Project 2022 Scholarship Issue

URI : https://id.erudit.org/iderudit/1097213ar
DOI : https://doi.org/10.29173/wclawr80

Aller au sommaire du numéro

Éditeur(s)

University of Alberta Library

ISSN

2563-2574 (numérique)

Découvrir la revue

Citer cet article

Lebensfeld, T. & Smalarz, L. (2022). Cross-Examination Fails to Safeguard Against Feedback Effects on Eyewitness Testimony. *The Wrongful Conviction Law Review*, *3*(3), 240–269. https://doi.org/10.29173/wclawr80

Résumé de l'article

The legal system relies heavily on eyewitness evidence to identify and prosecute criminal perpetrators, but wrongful convictions resulting from eyewitness misidentification have led many to conclude that eyewitness memory is unreliable. Advances in eyewitness identification research have produced a more nuanced understanding of eyewitness reliability, however. Whereas pristinely collected eyewitness identification evidence provides diagnostic information about a suspect's guilt or innocence, numerous contaminants of eyewitness memory can undermine the reliability of eyewitness identification evidence. One such contaminant is confirming post-identification feedback—feedback given to or inferred by an eyewitness that communicates that their identification decision was correct. Confirming feedback is inevitable in real cases involving eyewitness identification and compromises the diagnostic value of eyewitness memory to such an extent that it undermines evaluators' abilities to differentiate between accurate and mistaken eyewitnesses (Smalarz & Wells, 2014). The current research tested whether cross-examination, a fundamental legal safeguard for preventing wrongful conviction based on eyewitness misidentification, can help remedy the contaminating effects of feedback on eyewitness testimony. Evaluators (N = 128) viewed direct examination testimony or direct- and cross-examination testimony of accurate and mistaken eyewitnesses, some of whom had received confirming feedback following their identification. Although the majority of eyewitnesses admitted during cross-examination that some or all of their recollections may have been influenced by the feedback, viewing the cross-examination did not improve evaluators' abilities to differentiate between accurate and mistaken eyewitness testimony. Cross-examination appears to be an insufficient safeguard for preventing wrongful convictions based on contaminated eyewitness evidence.

Cross-Examination Fails to Safeguard Against Feedback Effects on Eyewitness Testimony

Taylor C. Lebensfeld and Laura Smalarz
School of Social and Behavioral Sciences,
Arizona State University
U.S.A.

The legal system relies heavily on eyewitness evidence to identify and prosecute criminal perpetrators, but wrongful convictions resulting from eyewitness misidentification have led many to conclude that eyewitness memory is unreliable. Advances in eyewitness identification research have produced a more nuanced understanding of eyewitness reliability, however. Whereas pristinely collected eyewitness identification evidence provides diagnostic information about a suspect's guilt or innocence, numerous contaminants of eyewitness memory can undermine the reliability of eyewitness identification evidence. One such contaminant is confirming post-identification feedback—feedback given to or inferred by an eyewitness that communicates that their identification decision was correct. Confirming feedback is inevitable in real cases involving eyewitness identification and compromises the diagnostic value of eyewitness memory to such an extent that it undermines evaluators' abilities to differentiate between accurate and mistaken eyewitnesses (Smalarz & Wells, 2014). The current research tested whether cross-examination, a fundamental legal safeguard for preventing wrongful conviction based on eyewitness misidentification, can help remedy the contaminating effects of feedback on eyewitness testimony. Evaluators (N = 128) viewed direct examination testimony or direct- and cross-examination testimony of accurate and mistaken eyewitnesses, some of whom had received confirming feedback following their identification. Although the majority of eyewitnesses admitted during cross-examination that some or all of their recollections may have been influenced by the feedback, viewing the cross-examination did not improve evaluators' abilities to differentiate between accurate and mistaken eyewitness testimony. Cross-examination appears to be an insufficient safeguard for preventing wrongful convictions based on contaminated eyewitness evidence.

I Introduction

It is relatively well-known that mistaken eyewitness identification is a leading cause of wrongful conviction (Innocence Project, n.d.). Examples of miscarriages of justice resulting from eyewitness misidentification abound in the popular media, from the Netflix series *Making a Murderer* (Ricciardi & Demos, 2015-2018) and *The Innocence Files* (Antinoro et al., 2020) to popular press books such as *Picking Cotton* (Thompson-Cannino et al., 2009) and *The Sun Does Shine* (Hinton et al., 2018), TED talks (e.g., Fraser, 2012; Loftus, 2013); podcasts (e.g., *Wrongful Conviction*, Flom & Wortis, 2020) and television shows with wide-reaching audiences such as Oprah, Dr. Phil, and 60 Minutes. These high-profile eyewitness errors have led to deep skepticism about whether eyewitness evidence can be trusted to effect justice in criminal cases. Fortunately, psychological research on eyewitness memory over the last 50 years has produced significant advances in scientific understanding of when eyewitness identification is likely to be reliable and when it creates a risk of wrongful conviction.

For decades, psychological researchers placed much of the blame for wrongful convictions involving eyewitness misidentification on triers of fact (e.g., jurors), who they criticized for having "nearly religious faith in the accuracy of eyewitness accounts" (Loftus et al., 2013, p. 274; see also Brigham & Bothwell, 1983; Lindsay et al., 1981; Wells et al., 1980). They also placed blame on eyewitnesses, whose confidence, they argued, bore little to no relation to the accuracy of their testimony (Brown et al., 1977; Clifford & Scott, 1978; Leippe et al., 1978)—a claim echoed by legal scholars, including by state courts (e.g., *State v. Guilbert*, 2012; *State v. Henderson*, 2011). Recent research, however, has shown that evaluators of eyewitness testimony can reliably differentiate between accurate and mistaken eyewitnesses (e.g., Smalarz & Wells, 2014; Kaminski & Sporer, 2017) and that eyewitness confidence can be highly informative of eyewitness identification accuracy (Wixted & Wells, 2017).

This sea change in the conclusions derived from scientific research on eyewitness identification stemmed largely from the important realization that eyewitness memory evidence, like physical trace evidence (e.g., fingerprints and biological evidence), is easily contaminated if not carefully collected, preserved, and analyzed (Wells, 1995; Wells & Loftus, 2003). Although police investigators have long exercised great caution in their handling of physical crime scene evidence—often bringing in specialized teams to search for and collect physical evidence—police have historically used far less pristine methods to collect memory evidence from crime eyewitnesses. As Wells noted, "police somehow feel perfectly free to fire poorly constructed questions at eyewitnesses on the spot, allow eyewitnesses to overhear other eyewitnesses, take spotty notes of eyewitnesses' answers (and not record the actual question asked), and generally not use any theory of a proper memory interview" (p. 727). The development of this *memory-as-trace-evidence* analogy and the corresponding recognition of the contaminability of eyewitness evidence shifted the blame for wrongful convictions based on eyewitness misidentification away from fact-finders and eyewitnesses and onto the legal system.

Fortunately, psychological scientists have identified several best practices that the legal system can use to avoid eyewitness memory contamination and maximize the reliability of eyewitness identification evidence (Wells et al., 1998, 2020). These practices include conducting a thorough interview with the eyewitness about what they witnessed as soon as practicable after the occurrence of the crime, testing the witness's recognition memory for the suspect using a single-suspect lineup with well-matched fillers, giving eyewitnesses proper pre-lineup instructions, administering the lineup in a double-blind fashion, and collecting a confidence statement from the eyewitness immediately following their lineup decision, among several others (see Wells et al., 2020). It is now generally accepted that, as long as scientific best practices are used, eyewitness identification decisions provide probative evidence of the suspect's guilt or innocence (e.g., Wells et al., 2015; Wade et al., 2018; Wixted et al., 2018) and eyewitness confidence can be relied on to assess the eyewitness's likely accuracy (Wixted & Wells, 2017; but see Smalarz, 2021 for a consideration of estimator suspect bias that can undermine eyewitness reliability).

Numerous law enforcement agencies across the country have adopted these best practice-procedures, whether through federal directive (Yates, 2017), court mandates, state legislation, or executive orders from state attorneys general (see Wells et al., 2020). Nevertheless, many jurisdictions have yet to implement procedural reforms, and some contaminants of eyewitness evidence are unavoidable even when best practices are used. In the current research, therefore, we tested whether a key legal safeguard for addressing unreliable eyewitness evidence—cross-examination of eyewitnesses—can help to remedy the problems associated with eyewitness memory contamination and facilitate evaluators' assessments of eyewitness identification accuracy in cases involving contamination.

A. Contaminants of Eyewitness Evidence

Eyewitness memory contaminants come in many forms, but the most harmful type of contamination is contamination that produces *suspect-specific bias* (Smalarz, 2021). In a properly conducted lineup, there is one person under suspicion (the suspect), and the rest of the lineup members are known-innocent individuals, typically called fillers. The purpose of including only a single suspect alongside known-innocent fillers is that the fillers siphon erroneous identifications away from the suspect, thereby protecting innocent suspects from misidentification (Smith et al., 2017; Wells & Turtle, 1986; Wells et al., 2015). Whereas an erroneous identification of the suspect typically results in the arrest and prosecution of that person, an erroneous identification of a filler is a less harmful error because fillers are not arrested or prosecuted.

The protective function of this single-suspect lineup model breaks down, however, in the presence of variables that produce suspect-specific bias. That is because *suspect-bias variables* increase the likelihood that an innocent suspect will be identified as opposed to one of the fillers (Smalarz, 2021). For example, a non-blind lineup administrator who knows which lineup member is the suspect (e.g., the case detective) is likely to exert influence—whether intentionally or unintentionally—on the eyewitness to identify that person (Kovera & Evelo, 2017). Conducting repeated identification procedures with the same eyewitness and the same suspect likewise increases the risk of misidentification. For example, testing the witness's recognition of the suspect using an initial photo lineup and then later using a live (in person) lineup with that same suspect and witness is prone to lead the witness to perceive the suspect as familiar in the live lineup, even

if the suspect was not the person who the eyewitness originally saw commit the crime (Hinz & Pezdek, 2001; Deffenbacher et al., 2006; Godfrey & Clark, 2010; Wixted et al., 2021). Building a lineup with low-similarity lineup fillers who make the suspect stand out likewise increases the chances that the witness will identify an innocent suspect (Fitzgerald et al., 2013). And perhaps obviously, using a single-suspect showup puts innocent suspects at grave risk of misidentification because there are no fillers to draw erroneous guesses away from the suspect (e.g., Wells et al., 2015; Smith et al., 2017).

Although concerns about eyewitness identification often center on whether or not an eyewitness is capable of mistakenly identifying an innocent individual, it has been argued that mistaken identifications per se are not what create a risk of wrongful conviction. Instead, it is when mistaken eyewitnesses are *highly confident* in their misidentification that the innocent suspect is at risk of being wrongfully convicted (Lindsay et al., 1981; Smalarz & Wells, 2013; Wells et al., 1979). After all, an unconfident eyewitness is unlikely to persuade a jury or a judge that the identified individual is guilty. Meanwhile, testimony from a confident eyewitness is highly persuasive to jurors (e.g., Cutler et al, 1988; Garrett, et al., 2020; Key et al., 2022; Lindsay et al., 1989; Slane & Dodson, 2022). Consequently, there is arguably an even more insidious effect of suspect-specific bias than increasing mistaken identification of innocent suspects: inflating confidence in innocent suspect identifications (Smalarz, 2021). Here, we review a number of suspect-bias variables that have been shown to inflate eyewitness confidence in mistaken identifications.

Non-Blind Lineup Administration

Non-blind lineup administration, in which the person administering the lineup knows which lineup member is the suspect, has been shown to not only increase the risk of misidentification but also inflate eyewitness confidence in a mistaken identification. Garrioch and Brimacombe (2001) randomly assigned pairs of participants to the role of eyewitness or lineup administrator. The eyewitnesses viewed a crime video and the lineup administrators were instructed that they would administer a photo lineup to the witness and ask the witness some questions about their memory of the crime. Some of the lineup administrators were told which lineup member was the suspect, whereas others were told nothing. The administrators then conducted the lineup procedure and interview, which concluded with administrators obtaining a confidence statement from the eyewitness about their identification. Eyewitnesses who identified the lineup member whom the administrator believed was the suspect were more confident in their identification than were witnesses whose administrator did not know which lineup member was the suspect.

Charman and Quiroz (2016) also compared blind (no knowledge of which lineup member was the suspect) and non-blind (knew which lineup member was the suspect) administrators' influence on witnesses' identification decisions and confidence. They had mock-eyewitnesses view a mock-crime video while they trained mock lineup administrators to conduct a photo lineup. They told half of the administrators who the suspect was and told the other half nothing about the identity of the suspect. The lineup procedure was videotaped for later analysis. At the conclusion of the procedure, eyewitnesses reported their confidence in their identification. Non-blind administration increased mistaken identifications of innocent suspects and inflated eyewitness

confidence in those mistaken identifications. Critically, non-blind lineup administration led to inflated eyewitness confidence *only* when the witness picked the suspect—not when the witness picked a filler or rejected the lineup, showing the suspect-specific nature of the administrator influence. Analyses of the lineup videotapes revealed a likely case of mistaken eyewitnesses' inflated confidence: Nonblind administrators were far more likely than blind administrators to smile at eyewitnesses when they identified the suspect.

Rehearsal and Repeated Questioning

Simply anticipating providing courtroom testimony has been shown to inflate eyewitnesses' confidence in their identification. Wells and colleagues (1981) had unsuspecting witnesses view a staged theft and then attempt to identify the thief from a culprit-present or a culprit-absent photo lineup. Half of the eyewitnesses were then briefed by a "prosecutor" who instructed the witnesses to rehearse their responses to potential questions that would be asked under cross-examination because the "defense attorney" would try to discredit them and catch any inconsistencies in what they said. The other half of eyewitnesses were not briefed about the cross-examination. All witnesses then participated in a cross-examination in which they were asked to describe what they saw and how confident they were in their identification of the thief. Mistaken eyewitnesses who had been told to prepare for cross-examination reported being significantly more confident in their identification than did mistaken eyewitnesses who had not been briefed on the cross-examination.

Repeatedly questioning eyewitnesses about an event—something bound to occur when witnesses are preparing to give courtroom testimony—can also inflate eyewitness confidence. Shaw and McClure (1996) staged a classroom interruption and then later questioned the students about what they had seen. The students were repeatedly questioned about some details of what they had witnessed, either once a week over a period of four weeks following the incident (Experiment 1) or three times over a period of five days following the incident (Experiment 2). The final questioning session always included a set of questions that had not been asked during the previous sessions as well as a set of questions that had been repeated across some or all sessions. In both experiments, confidence in responses to repeated questions was higher than confidence in responses to non-repeated questions, while the accuracy of the responses remained unchanged.

Post-Identification Feedback

Co-Witness Feedback. Luus and Wells (1994) investigated how co-witnesses to a crime might influence each other's confidence. Pairs of participants witnessed a staged theft and then were separated to attempt an identification of the thief's photo from a lineup. Critically, the photo of the thief was not present in the lineup, so all identifications were mistaken. Following their identification decision, each witness was led to believe that the other witness had already been shown the lineup. The researchers manipulated what they told each witness about the other witness's supposed decision. In one condition, witnesses were told that the other witness identified the same person from the lineup; in another condition, witnesses were told nothing. Following this co-witness feedback manipulation, the witnesses were interviewed by a uniformed police officer about what they saw and how confident they were in their identification. Eyewitnesses who were

told that their co-witness picked the same person reported being significantly more confident than did eyewitnesses who were not told about their co-witness's supposed choice. This basic co-witness feedback effect has been replicated in numerous studies using a variety of paradigms and participant samples (Charman et al., 2010; Erickson et al., 2016; Leippe et al., 2006; Semmler et al., 2004; Skagerberg, 2007; Skagerberg & Wright, 2009).

Administrator Feedback. Another major source of confidence contamination comes from information given to an eyewitness by the case detective, or lineup administrator, following an eyewitness's lineup decision. Noting that there were no legal restrictions against police officers telling witnesses whether or not they picked the actual suspect (Wells, 1993), Wells and Bradfield (1998) conducted the first test of how administrator feedback affects eyewitnesses. They showed security footage of a gunman entering a Target store to 352 mock-eyewitnesses and then presented the eyewitnesses with a five-person photographic lineup and asked the witnesses to identify the gunman. As in Luus and Wells (1994), the lineup did not contain the photo of the actual gunman, so all identifications were mistaken. Following their mistaken identifications, the experimenter told some witnesses "Good. You identified the actual suspect," and told others nothing. A short time later, witnesses were asked various questions analogous to questions typically asked of eyewitnesses at trial, including how certain they were at the time of their identification, how good of a view they got of the gunman's face, how much attention they were paying to the gunman's face in the video, and how willing they would be to testify about their identification in court, among others.

The findings revealed that the confirming feedback dramatically inflated witnesses' recollections of testimony-relevant judgments. Witnesses who received confirming feedback reported greater certainty in their mistaken identification, recalled having had a better view of the gunman during witnessing, recalled having paid more attention to the gunman's face, and were more willing to testify about their identification compared to witnesses who received no feedback. As stated by Wells and Bradfield (1998) "the confirming-feedback manipulation served to manufacture credible witnesses from a pool of inaccurate witnesses who were not particularly credible on their own" (p. 374).

This *post-identification feedback effect* has been widely replicated since it was first documented in 1998. A 2014 meta-analysis that combined data from more than 20 published articles representing 6,200 mock-witnesses from 10 different academic laboratories revealed the strength and breadth of the feedback effect (Steblay et al., 2014). Across these studies, only 6% of mistaken eyewitnesses reported very high confidence levels when they did not receive feedback. Among mistaken eyewitnesses who received confirming feedback, however, approximately 29% reported very high confidence levels. That is nearly a five-fold increase in the number of eyewitnesses who would potentially pass a "credibility threshold" and convince fact-finders of their accuracy—all as a result of receiving a simple confirmatory remark following their identification. Eyewitnesses' judgments about the quality of their view, degree of attention paid, basis for having made an identification, and others, are likewise strongly inflated by confirming feedback. This post-identification feedback effect has been shown to occur among college-aged adults as well as children (Hafstad et al., 2004), older adults (Neuschatz et al., 2005), and with actual eyewitnesses to serious crimes (Wright & Skagerberg, 2007).

The post-identification feedback effect is problematic for multiple reasons. First, post-identification feedback is unavoidable in real cases. Even in jurisdictions that have adopted double-blind lineup procedures in which feedback will not occur during the identification procedure, feedback is inevitable. Witnesses may receive feedback from a co-witness or media coverage of the case. Even in the absence of explicit feedback, witnesses will likely infer whether they identified the suspect based on how the case progresses. For example, if the witness is called to testify about their identification in a pretrial hearing, it is reasonable for them to assume that the person they picked is the person the police suspected. Smalarz and Wells (2020) recently demonstrated that simply being asked to provide testimony can inflate eyewitnesses' confidence in a mistaken identification.

The second reason why post-identification feedback is so problematic is that feedback has stronger effects on mistaken eyewitnesses than on accurate eyewitnesses (Bradfield et al., 2002; Steblay et al., 2014). If feedback inflated confidence to a similar extent for accurate and mistaken eyewitnesses, evaluators would still be able to tell the difference between accurate and mistaken eyewitnesses, even if the eyewitnesses all appeared more credible. However, because feedback has stronger effects on mistaken than on accurate eyewitnesses, it impairs evaluators' abilities to differentiate between accurate and mistaken eyewitnesses.

Smalarz and Wells (2014) demonstrated the consequences of this phenomenon for evaluations of eyewitness testimony. The researchers showed mock-eyewitnesses a simulated crime and manipulated whether eyewitnesses made accurate or mistaken identifications by giving witnesses either a culprit-present or a culprit-absent lineup. Following their identification, some eyewitnesses were given confirming feedback ("Good job! You got the guy.") and others were given no feedback. All the eyewitnesses then provided videotaped testimony about what they witnessed and who they identified, and a new sample of evaluators watched these testimony videos and judged the accuracy and credibility each eyewitness. Among eyewitnesses who were not given feedback, evaluators believed 70% of the accurate eyewitnesses and only 36% of the mistaken eyewitnesses, indicating that they were able to reliably—though not perfectly—differentiate between accurate and inaccurate eyewitnesses. When witnesses had received confirming feedback, however, evaluators believed accurate and mistaken eyewitnesses at nearly equal rates (about 63%). Hence, confirming feedback eliminated evaluators' abilities to discriminate between accurate and mistaken eyewitness testimony.

A limitation of Smalarz and Wells' (2014) study, however, is that evaluators did not have the benefit of viewing a rigorous cross-examination of the eyewitness about what they had been told and the extent to which the feedback may have influenced their testimony. Cross-examination is intended to aid jurors in their assessments of eyewitness evidence (*Greene v. McElroy,* 1959) and is considered a fundamental legal safeguard against wrongful conviction resulting from mistaken identification (Walters, 1985). Indeed, cross-examination has been regarded as the "greatest legal engine ever invented for the discovery of truth" (Wigmore, 1974, p. 32). Does cross-examination improve evaluators' abilities to differentiate between accurate and inaccurate eyewitnesses in cases involving testimony contamination?

B. Cross-Examination as a Safeguard Against Contaminated Eyewitness Testimony

An important caveat to Wigmore's (1974) claim that cross-examination is the greatest legal engine for the discovery of truth is that Wigmore's statement was about the capacity of cross-examination to sort between truth-tellers and liars. However, eyewitnesses who misidentify an innocent individual are genuinely mistaken, not intentionally lying. Thus, the standard function of cross-examination—to reveal inconsistencies and contradictions that undermine the witness's credibility—may not be as effective with an eyewitness who is honestly mistaken. The effectiveness of cross-examination for remedying contaminated eyewitness testimony rests on two key conditions (Devenport et al., 2002). First, witnesses (and/or police officers) must recognize, remember and be willing to report the presence of contaminants that may have affected the eyewitness. Second, jurors must be able to utilize information about the contaminants appropriately in their evaluations of the eyewitness's accuracy.

One test of whether witnesses can accurately report on the effects of a testimony contaminant was reported in the original article on the post-identification feedback effect (Wells & Bradfield, 1998). The researchers conducted a follow-up to their first experiment in which they tested whether witnesses were able to accurately report on how the feedback influenced them. Witnesses viewed surveillance footage of a gunman in a Target store and then made a mistaken identification from a culprit-absent lineup. Eyewitnesses then either received confirming feedback ("Good. You identified the actual suspect in the case.") or disconfirming feedback ("Oh. You identified number __. The actual suspect is number __.") Witnesses then completed the testimony-relevant measures, after which they were asked whether the experimenter told them anything about the person identified (yes, no) and, if so, to indicate what was said. Finally, witnesses were asked whether the feedback influenced their reports of their confidence, the quality of their view during witnessing, degree of attention paid during witnessing, and other testimony-relevant judgments.

A majority (90%) of the eyewitnesses who received feedback accurately reported the feedback that they had received. However, for the most part, eyewitnesses did not believe that the feedback had influenced them. For each measure, most witnesses denied that the feedback influenced their responses (52% to 90%). Moreover, witnesses who reported that they had *not* been influenced by the feedback were no less likely to have been influenced, suggesting that even though witnesses were aware that they had received feedback, they were unaware of whether their recollections have been affected by the feedback. These findings cast doubt on the efficacy of the cross-examination safeguard for remedying contaminated eyewitness testimony.

Although no research, to our knowledge, has tested whether cross-examination improves evaluations of eyewitness accuracy in cases involving eyewitness memory contamination, Wells and colleagues (1979) conducted an early test of whether cross-examination facilitates evaluators' abilities to differentiate between accurate and inaccurate eyewitness testimony more generally. The researchers subjected accurate and mistaken eyewitnesses to cross-examination about what they witnessed and about their identification. For half of the eyewitnesses, the cross-examination was flimsy: it consisted of open-ended questions that were not intended to elicit contradictions from the eyewitness. For the other half of the eyewitnesses, the cross-examination was carried out in an adversarial style that included questions that yielded short answers, questions intended to elicit contradictions, and occasional assertions of a false premise (e.g., "The person you saw had a jacket on, didn't she?" when the culprit had not in fact worn a jacket). The authors found that the

adversarial cross-examination facilitated evaluators' abilities to discriminate between accurate and inaccurate eyewitnesses, suggesting that perhaps a rigorous cross-examination of witnesses who received feedback may prove useful to evaluators.

In the current research, we tested whether cross-examination improves evaluators' abilities to differentiate between accurate and inaccurate eyewitness testimony in cases involving contamination. Mock-eyewitnesses were randomly assigned to view a culprit-present or culprit-absent lineup, thereby enabling us to secure both accurate and mistaken identifications. Half of the witnesses received confirming post-identification feedback following their identification, whereas the other half were told nothing. All eyewitnesses were then videotaped responding to direct examination questions about what they witnessed and who they identified, after which they were cross-examined. The cross-examination consisted of first asking witnesses whether they had received feedback about their identification from the lineup administrator. Witnesses who reported having received feedback were then further questioned and challenged about the influence of the feedback on their testimony.

A new sample of participant-evaluators then watched these eyewitness testimony videos and evaluated the eyewitnesses' accuracy. Critically, half of the evaluators saw only the direct examination of the eyewitness; the other half saw both the direct and cross-examination. Consistent with past research, we predicted that feedback would undermine evaluators' abilities to differentiate between accurate and mistaken eyewitnesses during direct examination (Smalarz & Wells, 2014). However, if cross-examination is an effective safeguard, then the detrimental effects of post-identification feedback on evaluations of eyewitness accuracy should be reduced among evaluators who view the cross-examination of the eyewitnesses.

II Method

A. Design

This research utilized a 2 (Identification Accuracy: Accurate vs. Mistaken) x 2 (Post-identification Feedback: Confirming feedback vs. No feedback) x 2 (Cross-examination: Present vs. Absent) mixed-factorial design in which Identification Accuracy and Post-identification Feedback were within-subjects factors and Cross-examination was a between-subjects factor. The experiment consisted of two phases: a witness phase (Phase 1) and an evaluator phase (Phase 2) and used many of the same materials and procedures as Smalarz and Wells (2014).

B. Phase 1: Witness Identifications, Testimony, and Cross-Examination

Participant-witnesses (hereafter called witnesses; $N = 128$) were undergraduate students at a large midwestern university who received course credit for their participation. To start, an experimenter told the witness that the study was designed to investigate the way people form impressions of others. Witnesses then viewed a one minute 28 second video of a simulated crime in which the culprit's face was clearly visible from multiple angles. In the video, the culprit switched his bag with another passenger's bag at an airport check in line. After viewing the video, an experimenter told the witness that the bag belonging to the man in the video contained a bomb and that they would now view a photo lineup to see if they could identify him.

We manipulated identification accuracy by presenting witnesses with either a culprit-present or culprit-absent lineup (e.g., Bradfield et al., 2002; Smalarz & Wells, 2014). The culprit-present lineup contained a photo of the culprit in addition to five filler photos (i.e., photos of other people who matched the description of the culprit), while the culprit-absent lineup contained only the five filler photos. The lineup procedure was designed to encourage witnesses to make an identification by implying that the culprit was present (regardless of whether he was present or not) and by having no explicit "not there" option. If the witness did not immediately identify someone, the experimenter stated, "Just do your best to try to identify the person from the video." Using this procedure, we secured a subset of both accurate (n = 64) and mistaken (n = 64) identifications. After making their identification, witnesses were randomly assigned to either receive confirming feedback ("Good job! You got the guy") or no feedback from the experimenter. Witnesses then responded to a set of self-report measures on the computer (Table 1).

Table 1

Witnesses' Self-Report Questions

Measure	Question	Scale
Certainty	How certain were you when you made the identification that the person you identified from the photo lineup was the person you saw in the video?	10% (not at all certain) to 100% (totally certain), in 10% intervals
View	How good a view did you get of the person in the video?	1 (very poor) to 10 (very good)
Attention	How much attention were you paying to the face of the person in the video while viewing the tape?	1 (none) to 10 (my total attention)
Face	How well were you able to make out specific features of the person's face from the video?	1 (not at all) to 10 (very well)
Basis	To what extent do you feel that you had a good basis to make an identification?	1 (no basis at all) to 10 (a very good basis)
Ease	How easy or difficult was it for you to figure out which person in the photo lineup was the person from the video?	1 (extremely difficult) 10 (extremely easy)
Time	From the time the lineup started, how much time do you estimate it took you to make an identification?	1 (I needed almost no time) to 10 (I had to look at the photos for a long time)
Willing	On the basis of your memory of the person in the video, how willing would you have been to testify in court that the person you identified was the same person you saw in the video?	1 (not at all willing) to 10 (totally willing)
Strangers	Generally, how good is your recognition memory for faces of strangers you have encountered on only one prior occasion?	1 (very poor) to 10 (excellent)
Image	How clear is the image you have in your memory of the person you saw in the video?	1 (not at all clear) to 10 (very clear)

Note. Due to a data recording error, self-report data were missing from one eyewitness.

After the eyewitnesses finished responding to the self-report measures on the computer, the experimenter directed them to a second room where a different experimenter, who was blind to the witness's experimental condition, greeted them and explained that "in this part of the study, we are interested in how witnesses might appear as they testify in court." The second experimenter then gave the witness a video consent form and asked if they would agree to be videotaped during a testimony interview. All witnesses consented to being videotaped.

The testimony interview consisted of a series of scripted questions and experimenters were trained to allow the witness to respond in their own words and never cut off the witnesses' answers. The experimenter began the direct examination by asking the witness to describe what they witnessed in the video in as much detail as possible. Witnesses generally provided narrative descriptions with details about the setting, bystanders, the culprit's actions throughout the video, and the physical appearance of the culprit. The experimenter then asked the witness to describe the quality of their view of the culprit, how much attention they paid to the culprit while watching the video, and how certain they were in their identification, as well as other testimony-relevant questions (the full testimony script is available at online: https://osf.io/78svc/?view_only=0a08cdaf360248cdacc34787c49d8372.

Finally, the experimenter began the cross-examination. The experimenter first asked the witness whether the experimenter who administered the lineup told the witness anything about the identification they made. If the witness said no, the experimenter then asked, "So you weren't told anything about whether or not you picked the right person?" For witnesses who admitted to having received feedback (all eyewitnesses who received feedback correctly reported so), the experimenter proceeded to question witnesses about whether the feedback might have distorted their testimony. Specifically, the experimenter asked the eyewitnesses, "Do you think that being told you were right may have influenced your answers to any of the questions I've asked you?" and, if the witness said yes, the experimenter asked them to explain how. The experimenter then asked the witness whether their reports of their certainty, view, and attention might have been influenced by the feedback (e.g., "Do you think that being told you were right may have influenced your answer to the question about how certain you were at the time of the identification?"). Witnesses who said yes were asked to explain how their responses might have been influenced. Witnesses who said no were further challenged about their responses (e.g., "So you don't think that being told you were right may have made you recall having been more confident than you actually were at the time of the identification?"). After these lines of questioning about witnesses' reports of confidence, view, and attention, the experimenter stated:

> Scientific research on eyewitness identifications has shown that witnesses who are told that they picked the right person tend to report that they were more certain, that they had a better view, and that they paid more attention than witnesses who are not told whether or not their decision was correct. Do you think it's possible that the same thing happened to you?

For witnesses who said no, the experimenter added, "Isn't it possible that you might have reported that you were more certain, had a better view, and paid more attention than you would have if you hadn't been told your decision was correct?" Finally, all witnesses, including those who did not report having received feedback, were asked to rate their identification confidence

one final time. Once the interview was complete, the experimenter debriefed the witness about the purpose of the research.

C. Phase 2: Evaluator Judgments of Testimony

Participant-evaluators (hereafter called evaluators, $N = 128$) viewed four of the videotaped eyewitness testimonies, one from each of cell of the 2 (Identification accuracy) ×2 (Post-identification feedback) design, in a random order. Specifically, they viewed videos of one mistaken witness who did not receive confirming feedback, one mistaken witness who received confirming feedback, one accurate witness who did not receive confirming feedback, and one accurate witness who received confirming feedback. Half of the evaluators viewed the full testimony, including both the direct and the cross-examination ($n = 64$), whereas the other half of evaluators viewed only the direct examination ($n = 64$).

Evaluators were instructed that they would be viewing a total of five videos, that the accuracy of the witnesses in the videos was unknown, and that the videos were randomly selected. These instructions were designed to deter evaluators from attempting to strategically guess the accuracy of the witnesses. Evaluators were not told that some witnesses received confirming feedback. After viewing each of the four eyewitness videos, evaluators responded to a series of questions on the computer in which they indicated whether they believed the witness had made an accurate or a mistaken identification and evaluated other aspects of the witness's testimony (see Table 2)[1]. Once they finished responding to all measures for each of the four videos, evaluators were debriefed and dismissed.

Table 2

Evaluators' Testimony Judgment Questions

Measure	Question	Scale
Belief	Do you think that the witness' identification from the photo lineup of the man who switched the bags was an accurate identification or an inaccurate identification?	Accurate or Inaccurate
Convincing	How convincing was the witness?	1 (Not at all convincing) to 10 (Totally convincing)
Confidence felt	How confident do you believe the witness felt that the person s/he identified was the person who switched the bags?	1 (Not at all confident) to 10 (Totally confident)
Confidence portrayed	How confident do you think the witness portrayed him or herself to be?	1 (Not at all confident) to 10 (Totally confident)

[1] We also intended to include a measure of evaluators' perceptions of the accuracy of the witness's description of what they witnessed in the video. Due to a programming error, however, this measure was not collected from one condition and was thus excluded from analysis.

View of culprit	How good of a view do you think the witness got of the man who switched the bags?	1 (Very poor view) to 10 (Very good view)
Mental image of culprit	How clear of a mental image do you think the witness had in memory of the person who switched the bags?	1 (Not at all clear) 10 (Very clear)
Attention paid	How much attention do you think the witness was paying when s/he witnessed the event?	1 (No attention) to 10 (Total attention)
Ability to recognize strangers	How good do you think the witness is at remembering faces of strangers?	1 (Very poor) to 10 (Excellent)
Additional evidence (reverse coded as evidence sufficiency)	If you were a juror at trial, how much additional evidence would you need to convict the person who was identified by the witness as the man who switched the bags?	1 (No additional evidence) to 10 (A lot of additional evidence)
Accuracy (scale)	Do you think the witness' identification was…	1 (Definitely inaccurate) to 10 (Definitely accurate)
Confidence reported	During the witness' testimony, how confident did the witness report having been in his/her identification?	1 (Not at all confident) to 10 (Totally confident)

III Results

A. Eyewitnesses' Self Reports

We first analyzed eyewitnesses' self-report data by averaging across all ten testimony-relevant judgments (Table 1) to create a single composite measure of witnesses' self-reported reliability. We examined this composite self-reported reliability variable using a two-way ANOVA in which identification accuracy and feedback were included as predictors of the composite self-reported reliability variable. There was a significant main effect of identification accuracy, such that accurate witnesses rated their reliability significantly higher (M = 7.65, SD = 1.48) than mistaken witnesses (M = 6.32, SD = 1.42), $F(1, 123) = 28.90$, $p < .001$, $d = 0.95$, 95% CI [0.58, 1.32]. There was also a significant main effect of feedback, such that witnesses who received confirming feedback rated their reliability significantly higher (M = 7.43, SD = 1.40) than did witnesses who did not receive feedback (M = 6.55, SD = 1.66), $F(1, 123) = 12.31$, $p < .001$, d = 0.62, 95% CI [0.27, 0.98]. The two-way interaction between identification accuracy and feedback was not significant, $F(1, 123) = 1.49$, $p = .225$.

In addition to the composite reliability measure, we conducted univariate ANOVA analyses for each of the individual self-report measures (see Table 3 for means and standard deviations). We found significant main effects of identification accuracy for all ten measures, with accurate eyewitnesses reporting higher levels than mistaken eyewitnesses, Fs ≥ 7.68, ps ≤ .006, ds ≥ 0.49, 95% CI [0.14, 0.84]. There were also significant main effects of feedback for the certainty, attention, face, basis, ease, willing, and strangers self-report measures, with witnesses reporting higher levels on these measures when they received confirming feedback than when they did not,

*F*s ≥ 4.46, *p*s ≤ .037, *d*s ≥ 0.38, 95% CI [0.02, 0.73] The main effect of feedback was not significant for the view, time, and image measures, *F*s ≤ 3.37, *p*s ≥ .069. There were no significant two-way interactions between identification accuracy and feedback for any of the self-report measures, *F*s ≤ 3.11, *p*s ≥ .080.

Table 3

Means and Standard Deviations for Witness Self-Report Measures by Condition

	Mistaken Eyewitnesses		Accurate Eyewitnesses	
	No Feedback	Confirming Feedback	No Feedback	Confirming Feedback
Certainty	5.06 (2.14)	6.61 (1.98)	7.53 (2.16)	8.38 (1.52)
View	7.63 (1.98)	8.48 (1.88)	8.91 (1.65)	9.22 (1.66)
Attention	6.06 (2.41)	7.61 (2.01)	7.72 (1.94)	8.09 (2.29)
Face	6.47 (1.98)	7.23 (2.36)	7.78 (2.18)	8.63 (1.86)
Basis	5.78 (2.25)	7.52 (1.98)	8.06 (2.45)	8.72 (1.97)
Ease	4.75 (1.87)	6.94 (2.03)	7.47 (2.29)	8.50 (1.63)
Time	5.88 (1.91)	4.84 (2.08)	3.88 (2.03)	4.16 (2.37)
Willing	3.94 (2.30)	5.58 (2.61)	7.03 (2.69)	8.13 (2.18)
Strangers	6.03 (2.27)	7.42 (2.17)	7.72 (2.22)	7.94 (1.90)
Image	5.84 (2.25)	6.84 (1.86)	7.56 (2.09)	7.53 (2.34)

Note. Mean (SD)

B. Eyewitnesses' Responses to Cross-Examination

Two coders who were blind to whether the witness made an accurate or a mistaken identification coded witnesses' responses to the cross-examination questions; disagreements were resolved by a third coder. Specifically, we coded eyewitness's responses to each question about whether the feedback had influenced their responses as "yes," "no," or "maybe" based on whether the witness at any point acknowledged the possibility of influence. For example, a witness who initially said that their response to the certainty question was not influenced but ultimately admitted that their response may have been influenced by the feedback was coded as "maybe."[2] We first

[2] One witness who responded "I don't know" to the question about whether her recollection of her view was influenced by the feedback was coded as "maybe." Additionally, our coding revealed that no follow-up was asked for two witnesses who claimed their response regarding their view was not influenced, for

present descriptive data for eyewitnesses' responses to the cross-examination questions (Table 4). We then present an analysis of the extent to which witnesses' self-reports of having been influenced reflected the actual influence of the feedback on their responses.

Recall that all eyewitnesses were initially asked whether the first experimenter told them anything about their identification and, if yes, what they were told. Witnesses who said that they weren't told anything were then prompted with, "So you weren't told anything about whether or not you picked the right person?" All witnesses who received feedback reported so either in response to the first (n = 59) or second (n = 5) prompt. When asked if the confirming feedback may have influenced any of their answers to the testimony questions, 65.6% responded yes or maybe. When asked if the feedback influenced their reports of their certainty, view, and attention, 78.1%, 48.4%, and 53.1% of witnesses responded yes or maybe, respectively. Finally, when responding to the statement about scientific research findings showing the effects of feedback on witnesses' reports of the certainty, view, and attention, 92.2% of witnesses acknowledged that this same thing may have happened to them.

Table 4

Witnesses' Responses to Cross-examination Questions

	Yes		Maybe		No	
Measure	*n*	%	*n*	%	*n*	%
Initial General Question	31	48.4	11	17.2	22	34.4
Certainty	36	56.3	14	21.9	14	21.9
View	20	31.3	11	17.2	33	51.6
Attention	24	37.5	10	15.6	30	46.9
Final General Question	45	70.3	14	21.9	5	7.8

Could witnesses accurately report the extent to which they were influenced by the feedback?

Next, we examined the extent to which witnesses' self-reports of the influence of the feedback aligned with the actual influence of the feedback. Using a series of one-way ANOVAs, we compared the self-reported certainty, view, and attention of witnesses who reported that they had been influenced by feedback (i.e., witnesses who responded yes or maybe to the relevant measure), witnesses who claimed not to have been influenced by feedback, and witnesses who did not receive

one witness who claimed their response regarding their attention was not influenced, and for three witnesses who claimed the cross-examiner's statement about scientific research findings showing the effects of feedback on witnesses' reports of the certainty, view, and attention did not apply to them. These witnesses' initial responses to each question were coded for analysis.

feedback (see Figure 1 for means). Specifically, we tested whether witnesses who denied having been influenced reported levels of certainty, view, and attention that were greater than or similar to those reported by witnesses who did not receive feedback.

For eyewitnesses' certainty in their identification, witnesses who received feedback reported being significantly more certain in their identification than did witnesses who did not receive feedback, regardless of whether the eyewitnesses who received feedback denied or admitted to having been influenced; no feedback versus denied influence $t(124) = 2.48$, $p = .015$, $d = 0.73$, 95% CI [0.14, 1.31]; no feedback versus admitted influence $t(124) = 2.57$, $p = .011$, $d = 0.49$, 95% CI [0.11, 0.86]. Moreover, the identification certainty of witnesses who admitted to and denied having been influenced by feedback did not significantly differ, $t(124) = -0.80$, $p = .426$.

The results were different for witnesses' reports of influence on their view and attention. Although witnesses who admitted that their reports of their view may have been influenced by the feedback reported having a better view than witnesses who did not receive feedback, $t(124) = 2.11$, $p = .037$, $d = 0.47$, 95% CI [0.03, 0.90], the reported view of witnesses who denied having been influenced by feedback did not significantly differ from that of witnesses who received no feedback, $t(124) = 0.86$, $p = .384$. The reported view of witnesses who denied having been influenced by feedback also did not significantly differ from that of witnesses who admitted being influenced by the feedback $t(124) = 1.13$, $p = .263$.

Similarly, although witnesses who admitted that their reports of their attention may have been influenced by feedback claimed to have paid closer attention to the culprit than witnesses who did not received feedback, $t(124) = 2.26$, $p = .025$, $d = 0.48$, 95% CI [0.06, 0.90], the reported attention of witnesses who denied having been influenced by feedback did not significantly differ from that of witnesses who received no feedback, $t(124) = 1.66$, $p = .100$. The reported attention of witnesses who denied having been influenced by feedback also did not significantly differ from that of witnesses who admitted being influenced by the feedback, $t(124) = 0.43$, $p = .665$.

Thus, it appears that witnesses who denied the influence of feedback on their reports of their view and attention did not exhibit as much inflation on these measures as witnesses who admitted the influence of feedback on these reports. Even so, their reports on these measures were not significantly lower than those of witnesses who admitted the influence of feedback on those questions, suggesting that there was still some lack of awareness of the influence of feedback on their self-reports.

Figure 1

Witnesses Self-Reports for Certainty, View, and Attention by Feedback and Influence

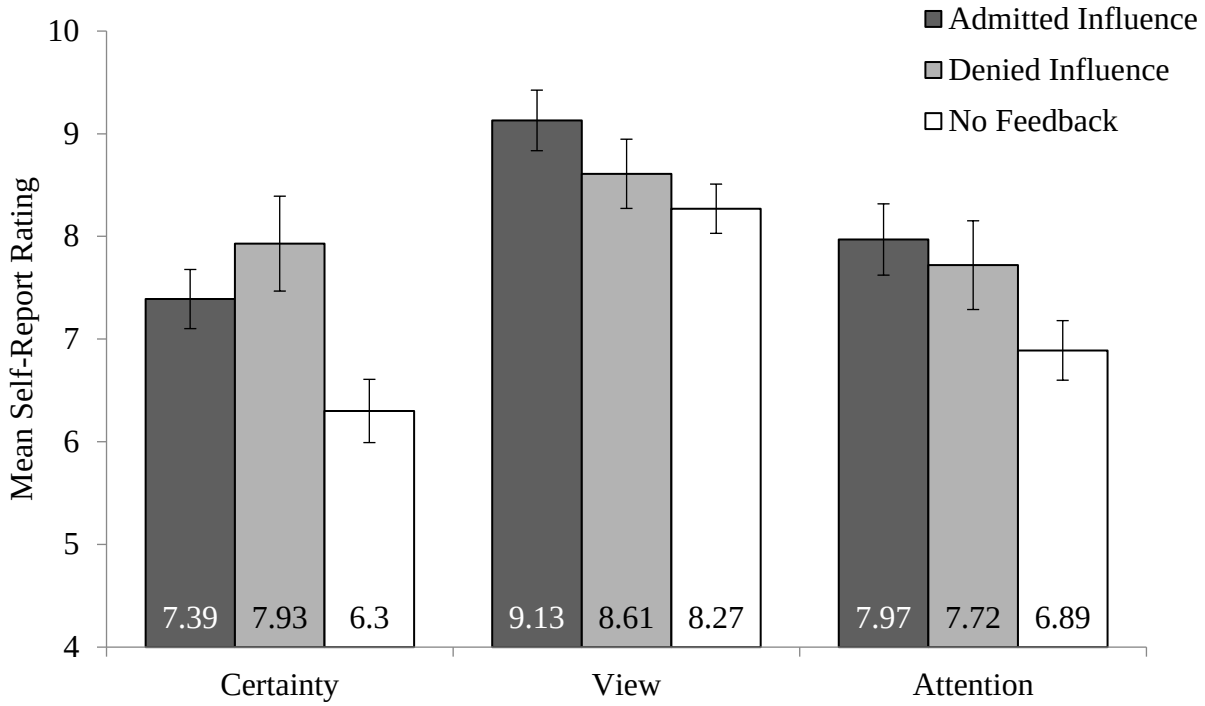

Figure 1. Mean self-report ratings of certainty, view, and attention among witnesses who received feedback and admitted having been influenced, received feedback and denied having been influenced, and did not receive feedback. Error bars denote standard error.

C. Evaluators' Judgments of Eyewitnesses' Testimonies

We first analyzed evaluators' judgments of whether they believed witnesses made an accurate identification using a generalized linear mixed-effects model in R (using lme4 and lmerTest) to account for the random effects of evaluators. Eyewitness identification accuracy, feedback, and cross-examination were included as fixed-effect predictors of evaluators' accuracy judgments. If cross-examination assists evaluators in differentiating between accurate and mistaken eyewitnesses in cases involving feedback, then we would expect to observe a significant three-way accuracy × feedback × cross-examination interaction.

The three-way interaction was not significant, $B = 0.70$, $SE = 0.76$, $z = -0.92$, $p = .356$. In fact, there were no significant effects involving cross-examination (see Figure 2), $zs \leq 1.36$, $ps \geq .175$. Accordingly, we reduced the model by removing the cross-examination term and examined the main and interactive effects of eyewitness accuracy and feedback. Replicating prior research (Smalarz & Wells, 2014), there were significant main effects of accuracy, $B = -0.72$, $SE = 0.19$, $z = -3.77$, $p < .001$, and feedback, $B = -1.00$, $SE = 0.26$, $z = -3.83$, $p < .001$, which were superseded by a significant accuracy × feedback interaction, $B = -1.11$, $SE = 0.38$, $z = -2.95$, $p = .003$. Follow-up comparisons revealed that, when no feedback was given to the witness, evaluators were significantly more likely to believe accurate than mistaken eyewitnesses (70.4% vs 32.7%

respectively), $z = -5.74$, $p < .001$, odds ratio (OR) = 0.21, 95% CI (OR) = [0.12, 0.35]. However, when feedback was given to the witness, evaluators believed accurate and mistaken eyewitnesses at similar rates (68.0% vs. 57.1% respectively), $z = -1.80$, $p = .071$, $OR = 0.62$, 95% CI (OR) = [0.37, 1.04].

Figure 2

Evaluators' Belief Judgments

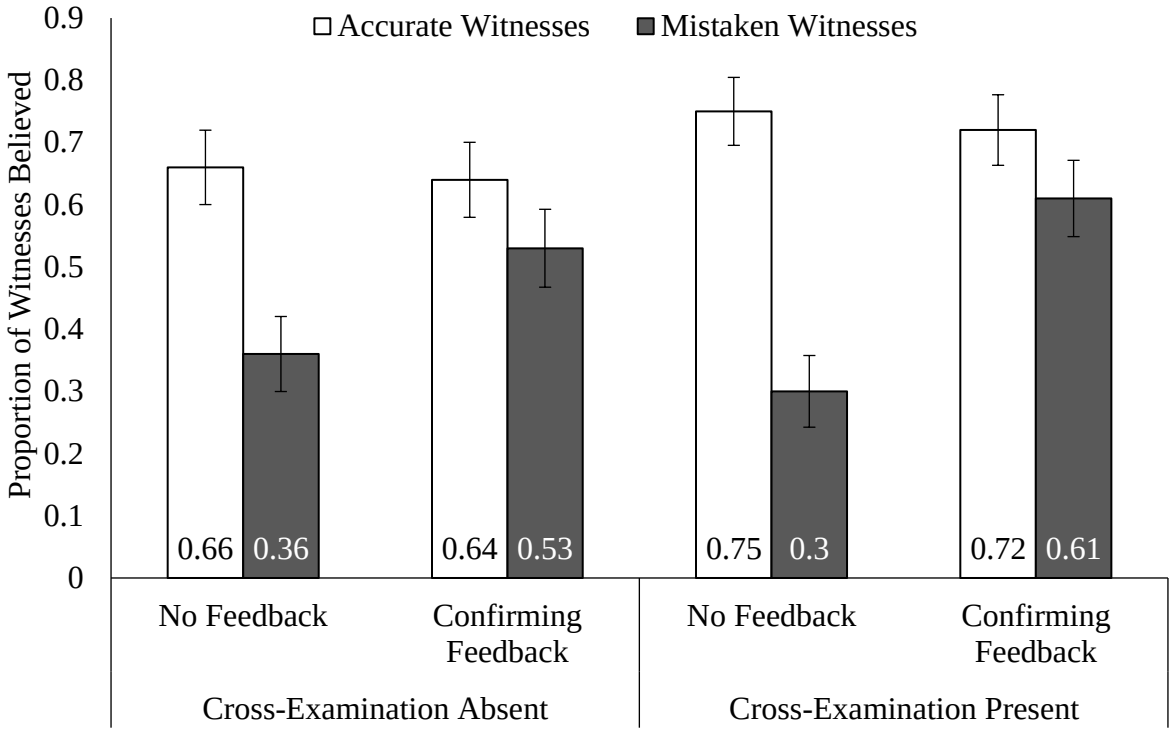

Figure 2. Proportion of witnesses evaluators believed made an accurate identification in each cell of the 2 (Identification Accuracy: Accurate vs. Mistaken) x 2 (Post-identification Feedback: Confirming feedback vs. No feedback) x 2 (Cross-examination: Present vs. Absent) design. Error bars denote standard error.

We also analyzed evaluators' other judgments of the witnesses' testimonies by creating a composite measure that averaged across all of the testimony judgments, with the additional evidence measure reverse-coded. Accordingly, higher values on the composite testimony measure correspond to more favorable evaluations of the eyewitness's testimony. We conducted the analysis in R using a linear mixed-effects model (again using lme4 and lmerTest) that included feedback, identification accuracy, and cross-examination as fixed-effect predictors of the composite measure. Evaluators were included as a random effect.

Consistent with the findings for evaluators' belief judgments, the three-way interaction was not significant, $B = 0.29$, $SE = 0.65$, $t(378) = 0.44$, $p = .658$, nor were any effects involving cross-examination, ts ≤ 0.62, ps $\geq .538$. We again reduced the model by removing the cross-examination term and examined the main and interactive effects of eyewitness accuracy and feedback. As with

the belief measure, there were significant main effects of accuracy, $B = 2.11$, $SE = 0.23$, $t(381) = 9.20$, $p < .001$, and feedback, $B = 1.13$, $SE = 0.23$, $t(381) = 4.93$, $p < .001$, which were superseded by a significant accuracy × feedback interaction, $B = -1.39$, $SE = 0.32$, $t(381) = -4.29$, $p < .001$. Follow-up comparisons revealed that, when no feedback was given to the witness, evaluators judged the testimonies of accurate witnesses as significantly more credible (M = 6.59, SD = 1.97) than those of mistaken witnesses (M = 4.49, SD = 1.80), $t(381) = -9.20$, $p < .001$, $d = 1.14$, 95% CI = [0.90, 1.39]. When feedback was given to the witness, evaluators still judged the testimonies of accurate witnesses as more credible (M = 6.33, SD = 1.79) than those of mistaken witnesses, but to a lesser extent (M = 5.62, SD = 1.80), $t(381) = -3.12$, $p = .002$, $d = 0.39$, 95% CI = [0.15, 0.63].

IV Discussion

Prior research has shown that confirming post-identification feedback undermines evaluators' abilities to differentiate between accurate and mistaken eyewitnesses by disproportionately inflating the believability of mistaken eyewitnesses (Smalarz & Wells, 2014). In the current work, we replicated the detrimental effect of feedback on evaluations of eyewitness testimony and further demonstrated that cross-examination does not remedy the issue. Even though the cross-examination led most eyewitnesses who received feedback to acknowledge that their recollections may have been influenced by the feedback, evaluators' belief of the eyewitnesses held steadfast. This finding reinforces a concern that has long been expressed by eyewitness scientists: Cross-examination is an insufficient safeguard against wrongful conviction based on mistaken eyewitness identification (Devenport et al., 2002; Epstein, 2007; Valentine & Maras, 2011; Wells et al., 1998).

As has now been shown in dozens of studies (Steblay et al., 2014), a simple confirmatory remark following an eyewitness's identification inflated their recollections of their identification confidence, degree of attention paid during witnessing, and other testimony-relevant recollections. Somewhat surprisingly, feedback effects on eyewitnesses' self-reports were not stronger among mistaken eyewitnesses than they were among accurate eyewitnesses, as indicated by the non-significant feedback × accuracy interaction on eyewitnesses' self-reports. This finding is at odds with much of the prior post-identification feedback research (Steblay et al., 2014), but is consistent with the findings from Smalarz and Wells (2014), who likewise found no significant interaction for eyewitnesses' self-reports but *did* observe an interaction for evaluators' belief judgments. In their research, as in the current experiment, feedback had stronger effects on evaluators' belief of mistaken than of accurate eyewitnesses despite not showing that same pattern for witnesses' own responses. Smalarz and Wells speculated that confirming feedback might have dynamic effects on eyewitnesses that are not always captured by the standard scale-rating measures of eyewitness confidence and other testimony-relevant judgments. The findings from the current research provide further support for that idea.

A. Eyewitnesses' Awareness of the Presence and Influence of Feedback

As in Wells and Bradfield's (1998) original post-identification feedback research, eyewitnesses in our study were quite capable of accurately reporting *whether* they had received feedback: All eyewitnesses who received feedback correctly reported so when asked. However,

we caution readers against presuming that real-world eyewitnesses who receive feedback would show such high rates of accurate responding. In our study, witnesses provided their testimony mere minutes after they made their identification. In real cases, eyewitnesses may not be asked whether they received feedback until months or even years after the lineup took place. Under such conditions, witnesses may not remember what they were told following their identification decision. Moreover, as discussed previously, there are a variety of contaminants of eyewitness confidence that do not involve explicit confirmation (e.g., feedback inferred from the case progression, repeated questioning), and witnesses might not recognize the presence of these sources of contamination.

When it came to witnesses accurately reporting *how* the feedback influenced their testimony, eyewitnesses in our study performed more poorly. Specifically, witnesses who admitted that the feedback may have influenced their confidence and witnesses who denied that the feedback influenced confidence showed similar levels of confidence inflation. In other words, witnesses who received feedback recalled having been more confident in their identification than did witnesses who did not receive feedback, and this was true regardless of whether the witnesses believed they had been influenced by the feedback. This pattern of results is revealing: It suggests that eyewitnesses' self-reports of whether feedback influenced their confidence cannot be relied on to determine whether confidence contamination occurred.

Witnesses' reports of the influence of feedback on their recollections of the quality of their view and the degree of attention paid to the culprit during witnessing yielded different results. On those measures, witnesses who denied that their recollections were influenced by the feedback did not show significant distortion on those measures, whereas witnesses who admitted that their recollections may have been influenced by the feedback did. Although these patterns suggest that witnesses who denied the influence of feedback on their view and attention were uninfluenced by the feedback, it is important to recognize the fact that these witnesses did *not* show significantly lower self-reported view and attention compared to witnesses who admitted having been influenced by feedback. In other words, witnesses who denied the influence of feedback could not be statistically differentiated from either group (no-feedback witnesses or admitted-influence witnesses). Indeed, an inspection of Figure 1 shows that witnesses who denied the influence of feedback on these reports fell in between the other two groups on self-reported view and attention, suggesting that they were influenced to some extent, but perhaps to a lesser extent than witnesses who admitted to the influence of feedback.

There are multiple potential interpretations of the discrepant findings regarding witnesses' awareness of the influence of feedback on their recollections of their confidence versus their recollections of their view and attention. One possibility is that witnesses are more able to accurately report on the effects of feedback on their testimony about the degree of attention paid and the quality of their view than they are to accurately report on the effects of feedback on their identification confidence. We are skeptical of this interpretation, however, in part because we can think of no psychological theory that predicts more accurate introspection regarding the effects of an external contaminant on recollections of view and attention than on recollections of confidence.

We think that a more likely explanation is that people do not have direct introspective access to the mental processes that occur in response to a stimulus (Nisbett & Wilson, 1977).

Therefore, instead of being able to accurately assess the influence of a stimulus (e.g., feedback) on their responses, people use implicit causal theories about the extent to which a particular stimulus is a plausible cause of a given response to estimate the effects of the stimulus. Research on the post-identification feedback effect shows that witnesses' recollections of their view and attention paid during witnessing tend to be less influenced by feedback than witnesses' recollections of their identification confidence (Steblay et al., 2014). Thus, to the extent that witnesses apply the same implicit causal theory about how feedback might influence their responses to these questions, it would lead witnesses to underestimate the effects of the feedback on their confidence and to more appropriately estimate the effects of the feedback on their self-reported view and attention. Future research could investigate this possibility. Nevertheless, for legal purposes, it is important to remember that, even if witnesses in our study did somewhat accurately report on the influence of feedback on some of their judgments, this did not improve evaluators' abilities to differentiate between accurate and mistaken eyewitnesses.

B. The Lack of Impact of Cross-Examination

A somewhat surprising finding in our research was that the cross-examination had no significant impact on evaluations of eyewitness accuracy. Evaluators were no less likely to believe eyewitnesses who had been rigorously cross-examined than they were to believe eyewitnesses who had not been cross-examined. This may have been because, although the cross-examination revealed that eyewitnesses had received feedback, evaluators are unaware of how damaging post-identification feedback can be. Indeed, a number of studies have shown that jurors fail to recognize the effects of variables that influence eyewitness accuracy and testimony (e.g., Desmarais & Read, 2011). It may be necessary, therefore, to supplement cross-examination with testimony from an expert who can inform fact-finders about the contaminating effects of feedback on eyewitness testimony (Benton et al., 2007; Cutler & Wells, 2009). However, expert testimony is not a panacea, and the extent to which it improves evaluators' assessments of eyewitness accuracy is not yet well established (e.g., Martire & Kemp, 2009).

There is another possible reason for the null effects of cross-examination on evaluations of eyewitness accuracy. Recent research suggests that informing fact-finders of a suspect-bias variable can backfire. In a recent study, Kulak and Smalarz (2022) examined evaluators' reactions to administrator suggestion in a videotaped lineup procedure. Evaluators in their study viewed a videotape of an eyewitness providing testimony about a witnessed event and identification. Half of the evaluators watched the testimony and the identification procedure; other evaluators watched the testimony only. Critically, half of the eyewitnesses had been exposed to administrator influence during the identification procedure, which was apparent to evaluators who saw the lineup procedure videos. Although viewing a video of an identification procedure sensitized the evaluators to procedural suggestion, which was in turn associated with decreased belief of the eyewitness, viewing the video also had the unintended effect of directly *increasing* evaluators' belief of the eyewitness, presumably because evaluators made inferences about the eyewitness's accuracy from the administrator's suggestive behavior. In the current study, mock-jurors might themselves have been persuaded of the witness's accuracy by learning that the witness was told they identified the correct person. Future research should investigate whether there are ways of informing evaluators of the presence of contamination without also directly biasing evaluators.

C. Implications for Trial Judges' Admissibility Determinations

There are important legal consequences of the current findings for cases involving post-identification feedback and other forms of eyewitness memory contamination. The legal system has a safeguard in place specifically for dealing with suggestively obtained eyewitness identification evidence. If a defendant standing trial can demonstrate that there was impermissible suggestion involved in the eyewitness's identification (e.g., the witness saw a photo of the suspect before viewing the lineup; the witness was presented with a single-suspect showup when a lineup could have been conducted; the eyewitness was given confirming post-identification feedback), and, as a result, there are sufficient concerns about the reliability of the eyewitness's identification, the trial judge can suppress the identification evidence, preventing the eyewitness's testimony from being heard by a jury at all.

The basic justification for this "reliability" approach to determining the admissibility of suggestively obtained identification evidence is that, in some cases, an eyewitness's identification is based on such a strong memory that it is invulnerable to suggestive influences. While this reasoning is logical, the unfortunate reality is that defendants' attempts to suppress suggestively obtained eyewitness identification evidence are almost never successful, even when the identification procedures were egregiously suggestive (Wells et al., 2012). The reason for the inefficacy of the evidence-suppression safeguard stems from a fundamental defect in the legal framework for determining reliability. In most states across the U.S., trial court judges use a framework set forth in the U.S. Supreme Court case *Neil v. Biggers* (1972), which was later affirmed in *Manson v. Brathwaite* (1977). The many shortcomings of the so-called Manson admissibility standard have been detailed elsewhere (e.g., Smalarz et al., 2016; Wells & Quinlivan, 2009). But the crux of the issue is to determine whether the suggestion produced a substantial enough threat to the reliability of the eyewitness's identification to warrant suppression of the identification evidence, the trial court judge is instructed to consider five factors: the eyewitness's confidence in their identification, the quality of the view the eyewitness had during witnessing, the degree of attention paid during the event, the quality of the witness's description of the culprit, and the amount of time between the witnessed event and the identification procedure.

What is hopefully immediately apparent to readers is that three of the five criteria that trial court judges use to evaluate eyewitness reliability—the witness's reports of their confidence, view, and attention—are themselves distorted by suggestive procedures. As a result, witnesses subjected to procedural suggestion, such as a heavy-handed detective who tells the witness who the suspect is and praises the witness's identification of the suspect, are likely to earn a very high standing on these reliability criteria. Yet, it is precisely *because* of the suggestion that these eyewitnesses have the illusion of reliability.

The findings from the current research demonstrate that, once an eyewitness's memory has been contaminated by suggestive influences such as feedback, there is little that the legal system can do to remedy the issue. It is not possible to "undo" contamination that has already occurred (Smalarz & Wells, 2013). And, as the current findings show, witnesses are ill equipped to report on the extent to which their testimony has been influenced by the suggestion. A trial court judge, therefore, has little recourse for determining whether the seeming reliability of a highly confident eyewitness who was exposed to suggestive procedures is attributable to the suggestion or the witness's original memory.

V Conclusion

The present findings support the criticism that cross-examination is an insufficient safeguard against wrongful conviction based on mistaken eyewitness identification. In our study, cross-examination was unable to correct for feedback's distorting effects on eyewitness testimony. One of the shortcomings of cross-examination is that it relies on witnesses' abilities to assess whether and how feedback influenced them, which witnesses struggle to do (Wells & Bradfield, 1998). These findings underscore the importance of a three key best-practice reforms for collecting eyewitness evidence. First, suspect bias must be controlled (Smalarz, 2021). Suspect bias (e.g., low-similarity lineup fillers, administrator influence, post-identification feedback), puts innocent suspects at increased risk of wrongful conviction because suspect bias increases the risk of confident mistaken identifications of innocent suspects. Second, eyewitness confidence and other self-reports that are relevant to assessing eyewitness accuracy must be recorded before contamination can occur (Steblay et al., 2014; Wells et al., 2020). Eyewitnesses' recollections related to the witnessed event (e.g., reports of what they witnessed, the quality of their view, degree of attention paid) should be documented as soon as practicable after the crime. Similarly, eyewitness's judgments related to their identification decision (e.g., identification confidence, willingness to testify against the suspect), should be documented immediately at the time of the identification procedure, before witnesses are exposed to inevitable contaminants such as post-identification feedback. Third, all interviews of eyewitnesses should be videotaped for later review (Kassin, 1998; Wells et al., 2020; National Research Council, 2014). Videotaping establishes a clear record of the eyewitness's recollections, which can be used later to help differentiate between genuine recollections and contaminated memory. Videotaped identification procedures can also help reveal procedural suggestion and prevent frivolous claims of suggestion when an identification procedure was conducted pristinely. Perhaps most importantly, proper records of eyewitnesses' uncontaminated memory reports provide diagnostic information upon which evaluators can rely to assess the eyewitness's likely accuracy. By treating eyewitness memory with the care and meticulousness that it treats other forms of contaminable trace evidence, the legal system can prevent wrongful convictions.

References

Antinoro, Michael, Garbus, Liz, Gibney, Alex, Staeger, Will, & Williams, Roger R. (Executive Producers). (2020). *The innocence files* [TV series]. Jigsaw Productions; One Story Up Productions; Story Syndicate.

Benton, Tanja R., McDonnell, Stephanie, Ross, David F., Thomas, W. Neil III, & Bradshaw, Emily (2007). Has eyewitness research penetrated the American legal system? A synthesis of case history, juror knowledge, and expert testimony. In R. C. L. Lindsay, D. F. Ross, J. D. Read, & M. P. Toglia (Eds.), *The handbook of eyewitness psychology, Vol. 2. Memory for people* (pp. 453–500). Lawrence Erlbaum Associates Publishers.

Bradfield, Amy L., Wells, Gary L., & Olson, Elizabeth A. (2002). The damaging effect of confirming feedback on the relation between eyewitness certainty and identification accuracy. *Journal of Applied Psychology, 87*(1), 112–120. https://doi.org/10.1037/0021-9010.87.1.112

Brigham, John C., & Bothwell, Robert K. (1983). The ability of prospective jurors to estimate the accuracy of eyewitness identifications. *Law and Human Behavior, 7*(1), 19–30. https://doi.org/10.1007/BF01045284

Brown, Evan, Deffenbacher, Kenneth, & Sturgill, William (1977). Memory for faces and the circumstances of encounter. *Journal of Applied Psychology, 62*(3), 311–318. https://doi.org/10.1037/0021-9010.62.3.311

Charman, Steve D., & Quiroz, Vanessa (2016). Blind sequential lineup administration reduces both false identifications and confidence in those false identifications. *Law and Human Behavior, 40*(5), 477-487. Online: https://doi.org/10.1037/lhb0000197

Charman, Steve D., Carlucci, Marianna, Vallano, Jon, & Gregory, Amy H. (2010). The selective cue integration framework: A theory of postidentification witness confidence assessment. *Journal of Experimental Psychology: Applied, 16*(2), 204–218. https://doi.org/10.1037/a0019495

Clifford, Brian R., & Scott, Jane (1978). Individual and situational factors in eyewitness testimony. *Journal of Applied Psychology, 63*(3), 352–359. https://doi.org/10.1037/0021-9010.63.3.352

Committee on Scientific Approaches to Understanding and Maximizing the Validity and Reliability of Eyewitness Identification in Law Enforcement and the Courts, Committee on Science, Technology, and Law, Policy and Global Affairs, Committee on Law and Justice, Division of Behavioral and Social Sciences and Education, National Research Council, National Research Council of the National Academies. (2014). *Identifying the Culprit: Assessing Eyewitness Identification*. The National Academies Press. Online: https://doi.org/10.17226/18891

Cutler, Brian L., Penrod, Steven D., & Stuve, Thomas E. (1988). Juror decision making in eyewitness identification cases. *Law and Human Behavior, 12*(1), 41–55. https://doi.org/10.1007/BF01064273

Cutler, Brian L., & Wells, Gary L. (2009). Expert testimony regarding eyewitness identification. In J. L. Skeem, K. S. Douglas, & S. O. Lilenfeld (Eds.), *Psychological science in the courtroom: Consensus and controversy* (pp. 100-123). Guilford Press.

Deffenbacher, Kenneth A., Bornstein, Brian H., & Penrod, Steven D. (2006). Mugshot exposure effects: Retroactive interference, Mugshot commitment, Source confusion, and Unconscious transference. *Law and Human Behavior, 30*(3), 287–307. https://doi.org/10.1007/s10979-006-9008-1

Desmarais, Sarah L., & Read, J. Don (2011). After 30 years, what do we know about what jurors know? A meta-analytic review of lay knowledge regarding eyewitness factors. *Law and Human Behavior, 35*(3), 200–210. Online: https://doi.org/10.1007/s10979-010-9232-6

Devenport, Jennifer L., Stinson, Veronica, Cutler, Brian L., & Kravitz, David A. (2002). How effective are the cross-examination and expert testimony safeguards? Jurors' perceptions of the suggestiveness and fairness of biased lineup procedures. *Journal of Applied Psychology, 87*(6), 1042–1054. https://doi.org/10.1037/0021-9010.87.6.1042

Epstein, Jules (2007). The great engine that couldn't: Science, Mistaken identifications, and the Limits of cross-examination. *Stetson Law Review*, *36*(3), 08-23. Online: https://ssrn.com/abstract=1100090

Erickson, William B., Lampinen, James M., Wooten, Alex, Wetmore, Stacy, & Neuschatz, Jeffrey (2016). When snitches corroborate: Effects of post-identification feedback from a potentially compromised source. *Psychiatry, Psychology and Law*, *23*(1), 148–160. https://doi.org/10.1080/13218719.2015.1035623

Fitzgerald, Ryan J., Price, Heather L., Oriet, Chris, & Charman, Steve D. (2013). The effect of suspect-filler similarity on eyewitness identification decisions: A meta-analysis. *Psychology, Public Policy, and Law*, *19*(2), 151–164. https://doi.org/10.1037/a0030618

Flom, J., & Wortis, K. (Executive Producers). (2020, November 10). Eyewitness Testimony (No. 170) [Audio podcast episode]. In *Wrongful conviction: Junk science*. Lava Productions. Online: https://omny.fm/shows/wrongful-conviction-1/170-wrongful-conviction-junk-science-eyewitness-te

Fraser, Scott (2012, September). *Why eyewitnesses get it wrong* [Video]. TEDx. Online: https://www.ted.com/talks/scott_fraser_why_eyewitnesses_get_it_wrong

Garrett, Brandon L., Liu, Alice, Kafadar, Karen, Yaffe, Joanne, & Dodson, Chad S. (2020). Factoring the Role of Eyewitness Evidence in the Courtroom. *Journal of Empirical Legal Studies*, *17*(3), 556-579. Online: https://doi.org/10.1111/jels.12259

Garrioch, Lynn, & Brimacombe, C. A. Elizabeth (2001). Lineup administrators' expectations: Their impact on eyewitness confidence. *Law and Human Behavior*, *25*(3), 299-315. https://doi.org/10.1023/A:1010750028643

Godfrey, Ryan D., & Clark, Steven E. (2010). Repeated eyewitness identification procedures: Memory, decision making, and probative value. *Law and Human Behavior*, *34*(3), 241–258. Online: https://doi.org/10.1007/s10979-009-9187-7

Greene v. McElroy, 360 U.S. 474, 79 S. Ct. 1400, 3 L. Ed. 2d 1377 (1959).

Hafstad, Gertrud S., Memon, Amina, & Logie, Robert (2004). Post-identification feedback, Confidence and recollections of witnessing conditions in child witnesses. *Applied Cognitive Psychology*, *18*(7), 901–912. Online: https://doi.org/10.1002/acp.1037

Hinton, Anthony R., Hardin, Lara L., & Stevenson, B. (2018). *The sun does shine: How I found life and freedom on death row*. St. Martin's Press.

Hinz, Tiffany, & Pezdek, Kathy (2001). The effect of exposure to multiple lineups on face identification accuracy. *Law and Human Behavior*, *25*(2), 185-198. Online: https://doi.org/10.1023/A:1005697431830

Innocence Project. (n.d.). *Eyewitness Identification Reform*. Online: https://innocenceproject.org/eyewitness-identification-reform/

Kaminski, Kristina S., & Sporer, Siegfried L. (2017). Discriminating between correct and incorrect eyewitness identifications: The use of appropriate cues. *Journal of Experimental Psychology: Applied*, *23*(1), 59–70. Online: https://doi.org/10.1037/xap0000110

Kassin, Saul M. (1998). Eyewitness identification procedures: The fifth rule. *Law and Human Behavior*, *22*(6), 649–653. Online: https://doi.org/10.1023/A:1025702722645

Key, Kylie N., Neuschatz, Jeffrey S., Gronlund, Scott D., Deloach, Danielle, Wetmore, Stacy A., McAdoo, Ryan M., & McCollum, Duncan (2022). High eyewitness confidence is always compelling: that's a problem. *Psychology, Crime & Law*. Online: https://doi.org/10.1080/1068316X.2021.2007912

Kovera, Margaret B., & Evelo, Andrew J. (2017). The case for double-blind lineup administration. *Psychology, Public Policy, and Law*, *23*(4), 421–437. Online: https://doi.org/10.1037/law0000139

Kulak, Kylie & Smalarz, Laura (2022, March). *Direct and indirect effects of procedural suggestion on evaluations of eyewitness identification evidence* [Data blitz presentation]. Annual American Psychology-Law Society Conference 2022, Denver, CO, United States.

Leippe, Michael R., Eisenstadt, Donna, Rauch, Shannon M., & Stambush, Mark A. (2006). Effects of social-comparative memory feedback on eyewitnesses' identification confidence, Suggestibility, and Retrospective memory reports. *Basic and Applied Social Psychology*, *28*(3), 201–220. Online: https://doi.org/10.1207/s15324834basp2803_1

Leippe, Michael R., Wells, Gary L., & Ostrom, Thomas M. (1978). Crime seriousness as a determinant of accuracy in eyewitness identification. *Journal of Applied Psychology*, *63*(3), 345–351. Online: https://doi.org/10.1037/0021-9010.63.3.345

Lindsay, R. C. L., Wells, Gary L., & O'Connor, Fergus J. (1989). Mock-juror belief of accurate and inaccurate eyewitnesses: A replication and extension. *Law and Human Behavior*, *13*(3), 333-339. Online: https://doi.org/10.1007/BF01067033

Lindsay, R. C. L., Wells, Gary L., & Rumpel, Carolyn M. (1981). Can people detect eyewitness-identification accuracy within and across situations? *Journal of Applied Psychology*, *66*(1), 79–89. Online: https://doi.org/10.1037/0021-9010.66.1.79

Loftus, Elizabeth (2013, June). How reliable is your memory? [Video]. TEDx. https://www.ted.com/talks/elizabeth_loftus_how_reliable_is_your_memory

Loftus, Elizabeth F., Doyle, James M., & Dysart, Jennifer E. (2013). *Eyewitness testimony: Civil and criminal*. Lexis Nexis. Online: https://www.abebooks.com/9780769867076/Eyewitness-Testimony-Civil-Criminal-2013-0769867073/plp

Luus, C. A. Elizabeth, & Wells, Gary L. (1994). The malleability of eyewitness confidence: Co-witness and perseverance effects. *Journal of Applied Psychology*, *79*(5), 714–723. Online: https://doi.org/10.1037/0021-9010.79.5.714

Manson v. Brathwaite, 432 U.S. 98, 97 S. Ct. 2243, 53 L. Ed. 2d 140 (1977).

Martire, Kristy A., & Kemp, Richard I. (2009). The impact of eyewitness expert evidence and judicial instruction on juror ability to evaluate eyewitness testimony. *Law and Human Behavior*, *33*(3), 225-236. Online: https://doi.org/10.1007/s10979-008-9134-z

Neil v. Biggers, 409 U.S. 188, 93 S. Ct. 375, 34 L. Ed. 2d 401 (1972).

Neuschatz, Jeffrey S., Preston, Elizabeth L., Burkett, Amanda D., Toglia, Michael P., Lampinen, James M., Neuschatz, Joseph S., Fairless, Andrew H., Lawson, Deah S., Powers, Rachael A., & Goodsell, Charles A. (2005). The effects of post -identification feedback and age on retrospective eyewitness memory. *Applied Cognitive Psychology*, *19*(4), 435–453. Online: https://doi.org/10.1002/acp.1084

Nisbett, Richard E., & Wilson, Timothy D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*(3), 231–259. Online: https://doi.org/10.1037/0033-295X.84.3.231

Ricciardi, Laura, & Demos, Moira (Executive Producers). (2015-2018). *Making a Murderer* [TV series]. Synthesis Films.

Semmler, Carolyn, Brewer, Neil, & Wells, Gary L. (2004). Effects of postidentification feedback on eyewitness identification and nonidentification confidence. *Journal of Applied Psychology*, *89*(2), 334–346. Online: https://doi.org/10.1037/0021-9010.89.2.334

Shaw, John S. III, & McClure, Kimberley A. (1996). Repeated postevent questioning can lead to elevated levels of eyewitness confidence. *Law and Human Behavior*, *20*(6), 629-653. Online: https://doi.org/10.1007/BF01499235

Skagerberg, Elin M. (2007). Co-witness feedback in line-ups. *Applied Cognitive Psychology*, *21*(4), 489–497. Online: https://doi.org/10.1002/acp.1285

Skagerberg, Elin M., & Wright, Daniel B. (2009). Susceptibility to postidentification feedback is affected by source credibility. *Applied Cognitive Psychology*, *23*(4), 506–523. Online: https://doi.org/10.1002/acp.1470

Slane, Crystal R., & Dodson, Chad S. (2022). Eyewitness confidence and mock juror decisions of guilt: A meta-analytic review. *Law and Human Behavior*, *46*(1), 45-66. Online: https://doi.org/10.1037/lhb0000481

Smalarz, Laura (2021). Suspect bias: A neglected threat to the reliability of eyewitness identification evidence. *Journal of Applied Research in Memory and Cognition*, *10*(3), 356–362. Online: https://doi.org/10.1016/j.jarmac.2021.06.005

Smalarz, Laura, Greathouse, Sarah M., Wells, Gary L., & Newirth, Karen A. (2016). Psychological science on eyewitness identification and the U.S. Supreme Court: Reconsiderations in light of DNA-exonerations and the science of eyewitness identification. In C. Willis-Esqueda, R. Wiener, & B. Bornstein (Eds.), *The Witness Stand and Lawrence S. Wrightsman, Jr.* (pp. 17-39) Springer Science + Business Media. Online: https://doi.org/10.1007/978-1-4939-2077-8_3

Smalarz, Laura, & Wells, Gary L. (2013). Eyewitness certainty as a system variable. In B. L. Cutler (Ed.), *Reform of eyewitness identification procedures* (pp. 161–177). American Psychological Association. Online: https://doi.org/10.1037/14094-008

Smalarz, Laura, & Wells, Gary L. (2014). Post-identification feedback to eyewitnesses impairs evaluators' abilities to discriminate between accurate and mistaken testimony. *Law and Human Behavior*, *38*(2), 194 –202. https://doi.org/10.1037/lhb0000067.

Smalarz, Laura, & Wells, Gary L. (2020). Do multiple doses of feedback have cumulative effects on eyewitness confidence? *Journal of Applied Research in Memory and Cognition, 9*(4), 508-518. Online: https://doi.org/10.1016/j.jarmac.2020.06.003

Smith, Andrew M., Wells, Gary L., Lindsay, R. C. L., & Penrod, Steven D. (2017). Fair lineups are better than biased lineups and showups, but not because they increase underlying discriminability. *Law and Human Behavior*, *41*(2), 127–145. Online: https://doi.org/10.1037/lhb0000219

State v. Guilbert, 306 Conn. 218, 49 A.3d 705 (2012).

State v. Henderson, 208 N.J. 208, 27 A.3d 872 (2011).

Steblay, Nancy K., Wells, Gary L., & Douglass, Amy B. (2014). The eyewitness post identification feedback effect 15 years later: Theoretical and policy implications. *Psychology, Public Policy, and Law*, *20*(1), 1–18. https://doi.org/10.1037/law0000001

Thompson-Cannino, Jennifer, Cotton, Ronald, & Torneo, Erin (2009). *Picking cotton: Our memoir of injustice and redemption*. St. Martin's Press.

Valentine, Tim, & Maras, Katie (2011). The effect of cross-examination on the accuracy of adult eyewitness testimony. *Applied Cognitive Psychology, 25*(4), 554-561. Online: https://doi.org/10.1002/acp.1768

Wade, Kimberley A., Nash, Robert A., & Lindsay, D. Stephen. (2018). Reasons to doubt the reliability of eyewitness memory: Commentary on Wixted, Mickes, and Fisher (2018). *Perspectives on Psychological Science, 13*(3), 339–342. Online: https://doi.org/10.1177/1745691618758261

Walters, Christopher M. (1985). Admission of expert testimony on eyewitness identification. *California Law Review, 73*(4), 1402–1430. https://doi.org/10.2307/3480433

Wells, Gary L. (1993). What do we know about eyewitness identification? *American Psychologist*, *48*(5), 553-571. Online: https://doi.org/10.1037/0003-066X.48.5.553

Wells, Gary L. (1995). Scientific study of witness memory: Implications for public and legal policy. *Psychology, Public Policy, and Law*, *1*(4), 726–731.

Wells, Gary L., & Bradfield, Amy L. (1998). "Good, you identified the suspect": Feedback to eyewitnesses distorts their reports of the witnessing experience. *Journal of Applied Psychology*, *83*(3), 360-376.

Wells, Gary L., Ferguson, Tamara J., & Lindsay, R. C. (1981). The tractability of eyewitness confidence and its implications for triers of fact. *Journal of Applied Psychology, 66*(6), 688–696. Online: https://doi.org/10.1037/0021-9010.66.6.688

Wells, Gary L., Greathouse, Sarah M., & Smalarz, Laura (2012). Why do motions to suppress suggestive eyewitness identifications fail? In B.L. Cutler (Ed.), *Conviction of the Innocent: Lessons from Psychological Research* (pp. 167-184). American Psychological Association Press. Online: https://doi.org/10.1037/13085-008

Wells, Gary L., Kovera, Margaret B., Douglass, Amy B., Brewer, Neil, Meissner, Christian A., & Wixted, John T. (2020). Policy and procedure recommendations for the collection and

preservation of eyewitness identification evidence. *Law and Human Behavior*, *44*(1), 3–36. Online: https://doi.org/10.1037/lhb0000359

Wells, Gary L., Lindsay, R. C., & Ferguson, Tamara J. (1979). Accuracy, confidence, and juror perceptions in eyewitness identification. *Journal of Applied Psychology*, *64*(4), 440–448. Online: https://doi.org/10.1037/0021-9010.64.4.440

Wells, Gary L., Lindsay, R. C. L., & Tousignant, J. P. (1980). Effects of expert psychological advice on human performance in judging the validity of eyewitness testimony. *Law and Human Behavior*, *4*(4), 275–285. Online: https://doi.org/10.1007/BF01040619

Wells, Gary L., & Loftus, Elizabeth F. (2003). Eyewitness memory for people and events. In R. K. Otto & I. B. Weiner (Eds.), *Handbook of psychology: Forensic psychology* (pp. 617-629). John Wiley & Sons Inc. Online: https://doi.org/10.1002/0471264385.wei1109

Wells, Gary L., & Quinlivan, Deah S. (2009). Suggestive eyewitness identification procedures and the Supreme Court's reliability test in light of eyewitness science: 30 years later. *Law and Human Behavior*, *33*(1), 1-24. Online: http://dx.doi.org/10.1007/s10979-008-9130-3

Wells, Gary L., Smalarz, Laura, & Smith, Andrew M. (2015). ROC analysis of lineups does not measure underlying discriminability and has limited value. *Journal of Applied Research in Memory and Cognition*, *4*(4), 313–317. https://doi.org/10.1016/j.jarmac.2015.08.008

Wells, Gary L., Small, Mark, Penrod, Steven, Malpass, Roy S., Fulero, Solomon M., & Brimacombe, C. A. Elizabeth (1998). Eyewitness identification procedures: Recommendations for lineups and photospreads. *Law and Human Behavior*, *22*(6), 603–647. Online: https://doi.org/10.1023/A:1025750605807

Wells, Gary L., & Turtle, John W. (1986). Eyewitness identification: The importance of lineup models. *Psychological Bulletin*, *99*(3), 320–329. Online: https://doi.org/10.1037/0033-2909.99.3.320

Wells, Gary L., Yang, Yueran, & Smalarz, Laura (2015). Eyewitness identification: Bayesian information gain, base-rate effect equivalency curves, and reasonable suspicion. *Law and Human Behavior*, *39*(2), 99–122. Online: https://doi.org/10.1037/lhb0000125

Wigmore, John H. (1974). *Evidence in trials at common law*. Little, Brown, and Co. (Original work published 1904).

Wixted, John T., Mickes, Laura, & Fisher, Ronald P. (2018). Rethinking the reliability of eyewitness memory. *Perspectives on Psychological Science*, *13*(3), 324-335. Online: https://doi.org/10.1177/1745691617734878

Wixted, John T., & Wells, Gary L. (2017). The relationship between eyewitness confidence and identification accuracy: A new synthesis. *Psychological Science in the Public Interest, 18*(1). Online: https://doi.org/10.1177/1529100616686966

Wixted, John T., Wells, Gary L., Loftus, Elizabeth F., & Garrett, Brandon L. (2021). Test a witness's memory of a suspect only once. *Psychological Science in the Public Interest, 22*(1), 1S-18S. Online: https://doi.org/10.1177/15291006211026259

Wright, Daniel B., & Skagerberg, Elin M. (2007). Postidentification feedback affects real eyewitnesses. *Psychological Science*, *18*(2), 172–178. Online: https://doi.org/10.1111/j.1467-9280.2007.01868.x

Yates, Sally Q., (2017). *Eyewitness identification: Procedures for conducting photo arrays*. U. S. Department of Justice. Online: https://www.justice.gov/file/923201/download